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PHYLLODISTOMUM LACHANCEI SP. NOV., A TREMATODE FROM THE URETERS OF *SALVELINUS FONTINALIS* (MITCHILL), WITH A NOTE ON ITS PATHOGENICITY[1]

BY L. P. E. CHOQUETTE[2]

Abstract

A new species of trematode (Gorgoderidae), *Phyllodistomum lachancei*, collected from speckled trout, *Salvelinus fontinalis* (Mitchill), in Montmorency County, Que., is described. The presence of this parasite in the ureters of the host produces at most only slight pathological changes.

In the course of the examination of speckled trout, *Salvelinus fontinalis* (Mitchill), collected in August, 1945, in the northern part of Quebec, specimens of a trematode were found in the ureters by Mr. F. Lachance of this Institute. The worms were present in small numbers only, not more than eight being recorded in any one fish. The flat edges of the worm were unrolled so that the parasite practically occluded the tube and, to the naked eye, presented the appearance of a small abscess. They could be removed from their habitat by gently pressing along the length of the tube in the direction distal from the kidneys. The flukes when expressed into water were very active, the anterior end being extended and bent as though it were a proboscis. This appearance is not evident, however, in the fixed specimens.

This parasite was found to belong to the genus *Phyllodistomum* Braun, 1899, and further studies showed it to be a hitherto undescribed species. The following description is based upon the study of mounted and unmounted specimens fixed in 70% alcohol, stained in alum carmine, and mounted in Canada balsam. Section of the kidney showing the worms *in situ* was also made.

Description

The body (Fig. 1) consists of two portions: an anterior one, elongated and distinctly set off from a wider, spatulated posterior one. The margins are smooth and the posterior end is notched. The average length of mounted specimens is 2.94 mm. while the average width taken at the level of space between the anterior margin of posterior testis and posterior margin of anterior testis is 1.31 mm. The terminal oral sucker is smaller than the acetabulum

[1] *Manuscript received April 3, 1947.*

Contribution from the Institute of Parasitology, Macdonald College, McGill University, with financial assistance from the National Research Council of Canada.

[2] *Research Assistant.*

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situated at the junction of the anterior and posterior portions of the body. The ratio of the diameter of the oral sucker to that of the acetabulum is as 1 : 1.24.

The length of the oesophagus is less than the length of the oral sucker. The intestinal caeca extend to the posterior end of the body. The vitellaria are oval and smooth, although occasionally, in immature specimens, indented vitellaria are seen; they are posterolateral and very close to the acetabulum, sometimes overlapping it. The vitelline ducts join medially. The shell gland lies between the vitelline glands in front of the common vitelline duct.

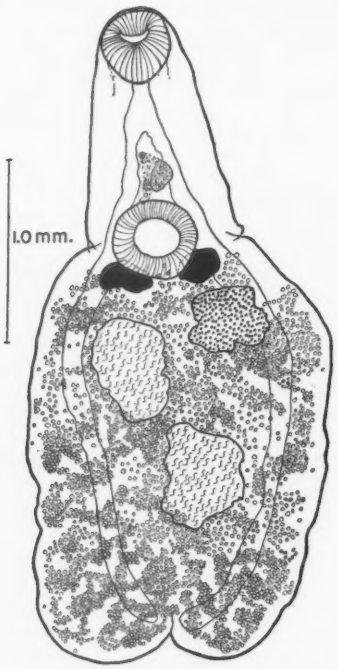

FIG. 1. *Phyllodistomum lachancei, adult, ventral view.*

The ovary is irregularly shaped, strongly lobate or faintly indented on either side, amphitypic; it is smaller than either testis and lies very close to the vitellarium of the same side. The uterus is voluminous and contains a great number of eggs; the uterine coils, intra- and extra-caeca run backwards to the posterior margin of the body and forward to the anterior margin of the ovary. The testes are obliquely placed, fairly close to each other, elongated or roundish, irregularly lobate or indented. The distance between the testes is less than the lesser dimension of either testis. The testes lie in the middle of the posterior part of the body, the anterior one being behind and oblique to the ovary. The seminal vesicle is quite large and dilated posteriorly.

The genital pore is situated ventrally in the space between the intestinal bifurcation and the anterior margin of the acetabulum. The excretory pore is terminal and lies at the posterior notch.

Measurements are given in millimetres, with the average in parentheses, of 25 carmine-stained specimens, mounted in Canada balsam. Body: length, 2.01–3.68 (2.92); width, at level of space between posterior margin of anterior testis and anterior margin of posterior testis, 0.96–1.49 (1.31). Oral sucker: diameter, 0.22–0.36 (0.278); acetabulum: diameter, 0.24–0.42 (0.346). Oesophagus: length, 0.105–0.181 (0.144). Right vitellarium: length and width, 0.07–0.22 by 0.10–0.27 (0.15 by 0.19); left vitellarium: length and width, 0.07–0.18 by 0.12–0.25 (0.13 by 0.19). Ovary: length and width, 0.16–0.39 by 0.15–0.36 (0.27 by 0.23). Testes—anterior: length and width, 0.31–0.74 by 0.19–0.54 (0.50 by 0.41); posterior: length and width, 0.36–0.75 by 0.30–0.57 (0.53 by 0.42); distance between anterior and posterior testis, 0.06–0.45 (0.18). Older intrauterine eggs obtained by dissection of the worm measure 0.03–0.05 by 0.02–0.03 (0.04 by 0.02).

Comparison of this species with descriptions of all the other known species of *Phyllodistomum* shows that it differs from all of them by the presence or absence of one or more morphological characters. By having a body definitely divided into two portions it differs from: *P. acceptum* (6), *P. conostomum* (6), *P. elongatum* (6), *P. lesteri* (15), *P. linguale* (6), *P. marinum* (6), *P. nocomis* (3), *P. parasiluri* (16), *P. sinense* (14). An oral sucker smaller than the acetabulum distinguishes it from *P. brevicecum* (13), *P. caudatum* (12), *P. etheostomae* (4), *P. morgurndae* (16), *P. pearsei* (5), and *P. unicum* (6). The size, shape, and position of the gonads distinguish it from *P. almorii* (10), *P. americanum* (6), *P. angulatum* (6), *P. carolini* (5), *P. entercolpium* (6), *P. fausti* (6), *P. hunteri* (1), *P. kajika* (2), *P. lacustri* (6), *P. lohrenzi* (7), *P. lysteri* (9), *P. macrobrachiola* (16), *P. macrocotyle* (6), *P. megalorchis* (6), *P. nocomis* (3), *P. notropidus* (3), *P. patellare* (6), *P. pseudofolium* (6), *P. semotili* (3), *P. shandrai* (2), *P. singulare* (8), *P. solidum* (11), *P. spatula* (6), *P. spatulaeforme* (6), *P. staffordi* (6), and *P. undulans* (13). It resembles most closely *P. folium* (6) and *P. simile* (6). It differs from the former by its length and width, size of oral sucker and acetabulum, shape and position of the testes, the extent of the uterine coils and size of eggs; it differs from the latter by its size, its larger vitellarium, the shape and position of the testes and size of eggs. Its smooth margins distinguish it from *P. superbum* (6) in which the margins are heavily crinkled. Therefore, it is considered that these differences are sufficient to separate the present specimens from the species described previously in this genus and accordingly the name *Phyllodistomum lachancei* is proposed for it.

Host: *Salvelinus fontinalis* (Mitchill).

Habitat: Ureters.

Locality: Montmorency County, Province of Quebec, Canada.

Type and co-types: British Museum (Natural History), Cromwell Road, London, S.W. 7, England.

Pathogenicity

The presence of this parasite in the ureters produces at most only slight pathological changes. There is a dilation of the ureters with some flattening of the lining columnar epithelial cells (Figs. 2 to 5). From sections studied there is no evidence of damage to the parenchymal tissue.

References

1. ARNOLD, J. G., JR. Some trematodes of the common bullhead *Ameiurus nubulosus* (Le Sueur). Trans. Am. Microscop. Soc. 53 : 267-276. 1934.
2. BHALAREO, G. D. Studies on the helminths of India. Trematoda. IV. J. Helminthol. 15 : 97-124. 1937.
3. FISCHTHAL, J. H. Three new species of *Phyllodistomum* (Trematoda : Gorgoderidae) from Michigan fishes. J. Parasitol. 28 : 269-274. 1942.
4. FISCHTHAL, J. H. A description of *Phyllodistomum etheostomae* Fischthal, 1942 (Trematoda : Gorgoderidae), from percid fishes. J. Parasitol. 29 : 7-9. 1943.
5. HOLL, F. J. The phyllodistomes of North America. Trans. Am. Microscop. Soc. 48 : 48-53. 1929.
6. LEWIS, F. J. The trematode genus *Phyllodistomum* Braun. Trans. Am. Microscop. Soc. 54 : 103-117. 1935.
7. LOEWEN, S. L. A new trematode of the family Gorgoderidae. J. Parasitol. 21 : 194-196. 1935.
8. LYNCH, J. E. *Phyllodistomum singulare* n. sp., a trematode from the urinary bladder of *Dicamptodon ensatus* (Eschscholtz), with notes on related species. J. Parasitol. 22 : 42-47. 1936.
9. MILLER, M. J. Parasites of freshwater fish. III. Further studies on the internal trematodes of fish in the central St. Lawrence watershed. Can. J. Research, D, 18 : 423-434. 1940.
10. PANDE, B. P. On the morphology and systematic position of a new bladder fluke from an Indian frog. Ann. & Mag. Natural Hist. 20 : 250-256. 1937.
11. RANKIN, J. S. New helminths from North Carolina salamanders. J. Parasitol. 23 : 29-42. 1937.
12. STEELMAN, G. M. A description of *Phyllodistomum caudatum* n. sp. Am. Midland Naturalist, 19 : 613-616. 1938.
13. STEEN, E. B. Two new species of *Phyllodistomum* (Trematoda : Gorgoderidae) from Indiana fishes. Am. Midland Naturalist, 20 : 201-210. 1938.
14. WU, K. Phyllodistomes from Shanghai area. (Trematoda : Gorgoderidae). Lingnan Sci. J. 16 : 209-213. 1937.
15. WU, K. Progenesis of *Phyllodistomum lesteri* sp. nov. (Trematoda : Gorgoderidae) in freshwater shrimps. Parasitology, 30 : 4-19. 1938.
16. YAMAGUTI, S. Studies on the helminth fauna of Japan. Part 2. Trematodes of fishes, 1. Japan. J. Zool. 5 : 249-541. 1934.

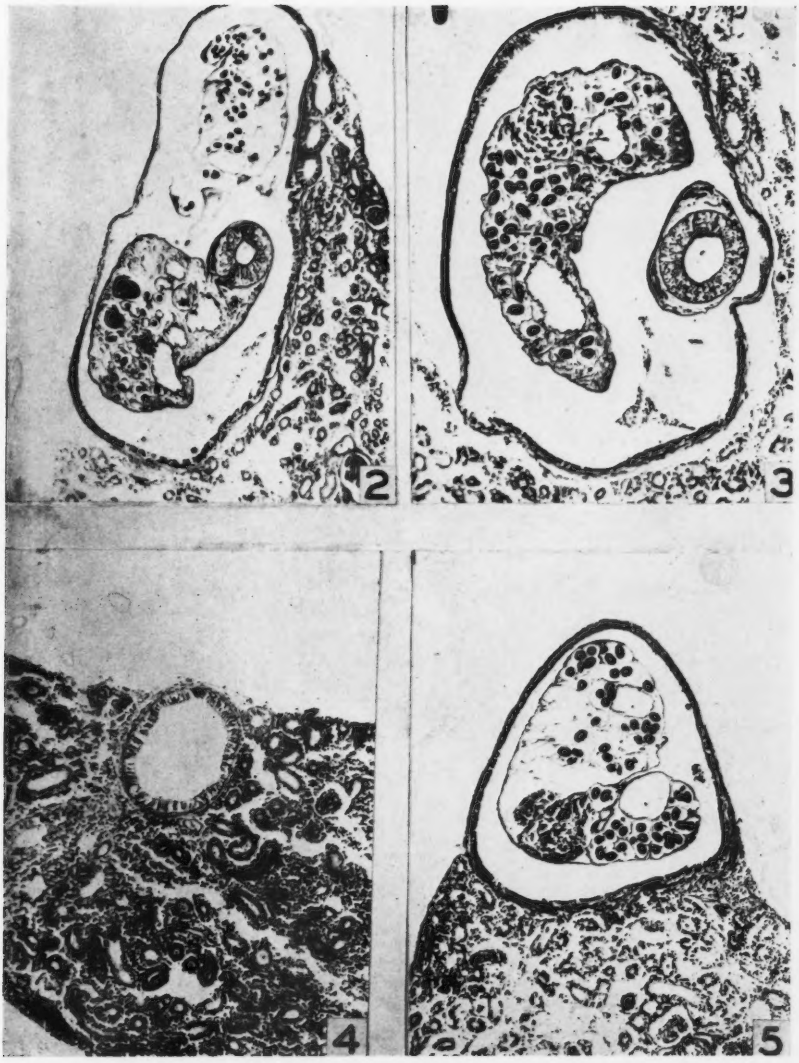

FIG. 2. *Photomicrograph of section of Phyllodistomum lachancei in situ.* ×36.
FIG. 3. *Photomicrograph of section of Phyllodistomum lachancei in situ.* ×60.
FIG. 4. *Photomicrograph of section of normal ureter of Salvelinus fontinalis.* ×60.
FIG. 5. *Photomicrograph of section of Phyllodistomum lachancei in situ.* ×60.

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